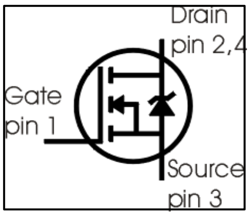
SIPMOSÒ Power-Transistor

Feature

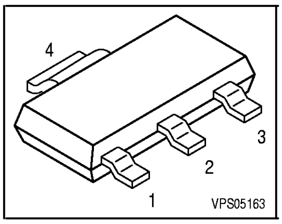
- N-Channel
- Enhancement mode
- Logic Level
- dv/dt rated
- Pb-free lead plating; RoHS compliant

Product Summary

V_{DS}	400	V
$R_{DS(on)}$	25	Ω
I_D	0.17	A



SOT-223



Type	Package	Tape and Reel Information	Marking
BSP324	SOT-223	E6327: 1000 pcs/reel	BSP324
BSP324	PG-SOT-223	L6327: 1000 pcs/reel	BSP324

Maximum Ratings, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Value	Unit
Continuous drain current	I_D		A
T_A=25°C		0.17	
T_A=70°C		0.14	
Pulsed drain current T_A=25°C	$I_{D\ puls}$	0.68	
Reverse diode dv/dt I_S=0.17A, V_{DS}=320V, di/dt=200A/µs, T_{jmax}=175°C	dv/dt	6	kV/µs
Gate source voltage	V_{GS}	±20	V
ESD Sensitivity (HBM) as per MIL-STD 883		Class 1	
Power dissipation T_A=25°C	P_{tot}	1.8	W
Operating and storage temperature	T_j , T_{stg}	-55... +150	°C
IEC climatic category; DIN IEC 68-1		55/150/56	

Thermal Characteristics

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Characteristics					
Thermal resistance, junction - soldering point (Pin 4)	R_{thJS}	-	16	25	K/W
SMD version, device on PCB:	R_{thJA}				
@ min. footprint		-	85	115	
@ 6 cm^2 cooling area [1)]		-	45	70	

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Values			Unit
		min.	typ.	max.	
Static Characteristics					
Drain-source breakdown voltage V_{GS}=0, I_D=250µA	$V_{(BR)DSS}$	400	-	-	V
Gate threshold voltage, $V_{GS} = V_{DS}$ I_D=94µA	$V_{GS(th)}$	1.3	1.9	2.3	
Zero gate voltage drain current	I_{DSS}				µA
V_{DS}=400V, V_{GS}=0, T_j=25°C		-	0.01	0.1	
V_{DS}=400V, V_{GS}=0, T_j=125°C		-	-	10	
Gate-source leakage current V_{GS}=20V, V_{DS}=0	I_{GSS}	-	10	100	nA
Drain-source on-state resistance V_{GS}=4.5V, I_D=0.05A	$R_{DS(on)}$	-	14.3	22	Ω
Drain-source on-state resistance V_{GS}=10V, I_D=0.17A	$R_{DS(on)}$	-	13.6	25	

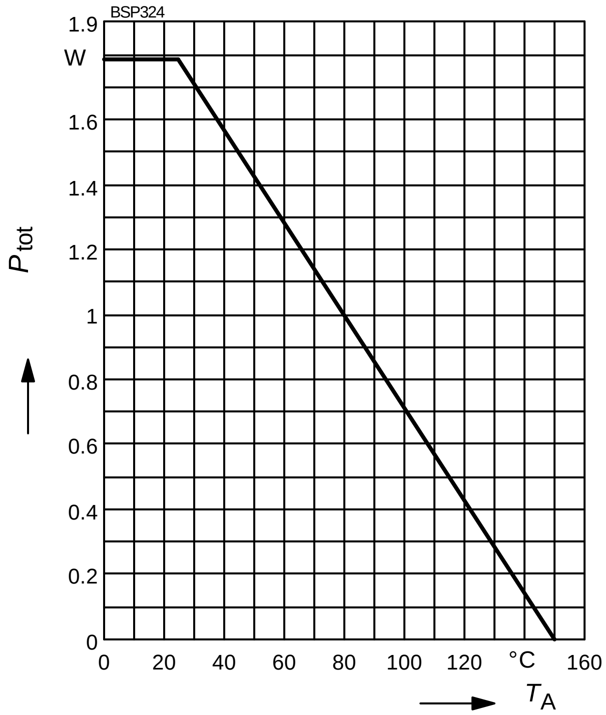
[1]Device on 40mm*40mm*1.5mm epoxy PCB FR4 with 6cm² (single layer, 70 µm thick) copper area for drain connection. PCB is vertical without blown air.

Electrical Characteristics, at T_j = 25 °C, unless otherwise specified

Parameter	Symbol	Conditions	Values			Unit
			min.	typ.	max.	
Dynamic Characteristics						
Transconductance	g_{fs}	V_{DS}≥2*I_D*$R_{DS(on)max}$, I_D=0.14A	0.09	0.19	-	S
Input capacitance	C_{iss}	V_{GS}=0, V_{DS}=25V, *f*=1MHz	-	103	154	pF
Output capacitance	C_{oss}		-	9.2	13.6	
Reverse transfer capacitance	C_{rss}		-	3.8	5.7	
Turn-on delay time	$t_{d(on)}$	V_{DD}=225V, V_{GS}=10V, I_D=0.17A, R_G=6Ω	-	4.6	6.9	ns
Rise time	t_r		-	4.4	6.6	
Turn-off delay time	$t_{d(off)}$		-	17	25	
Fall time	t_f		-	68	102	
Gate Charge Characteristics						
Gate to source charge	Q_{gs}	V_{DD}=320V, I_D=0.17A	-	0.35	0.45	nC
Gate to drain charge	Q_{gd}		-	2.17	2.82	
Gate charge total	Q_g	V_{DD}=320V, I_D=0.17A, V_{GS}=0 to 10V	-	4.54	5.9	
Gate plateau voltage	$V_{(plateau)}$	V_{DD}=320V, I_D=0.17A	-	3.6	-	V
Reverse Diode						
Inverse diode continuous forward current	I_S	T_A=25°C	-	-	0.17	A
Inv. diode direct current, pulsed	I_{SM}		-	-	0.68	
Inverse diode forward voltage	V_{SD}	V_{GS}=0, I_F=0.17A	-	0.8	1.2	V
Reverse recovery time	t_{rr}	V_R=200V, I_F=I_S, di_F/dt=100A/µs	-	85	127	ns
Reverse recovery charge	Q_{rr}		-	104	156	nC

1 Power dissipation

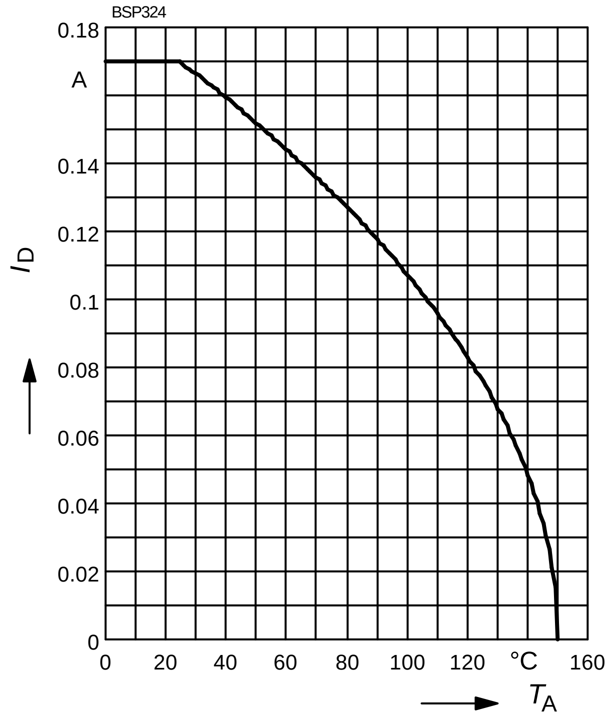
$P_{tot} = f(T_A)$



2 Drain current

$I_D = f(T_A)$

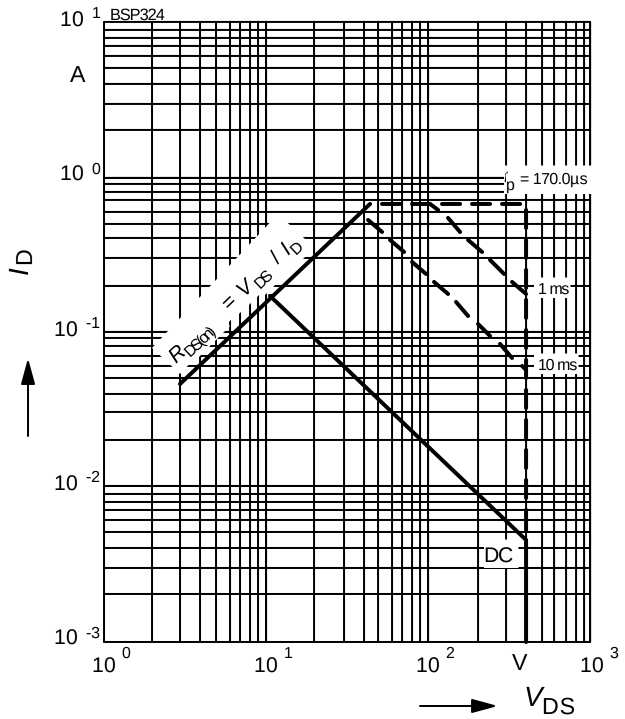
parameter: $V_{GS} \geq 10$ V



3 Safe operating area

$I_D = f(V_{DS})$

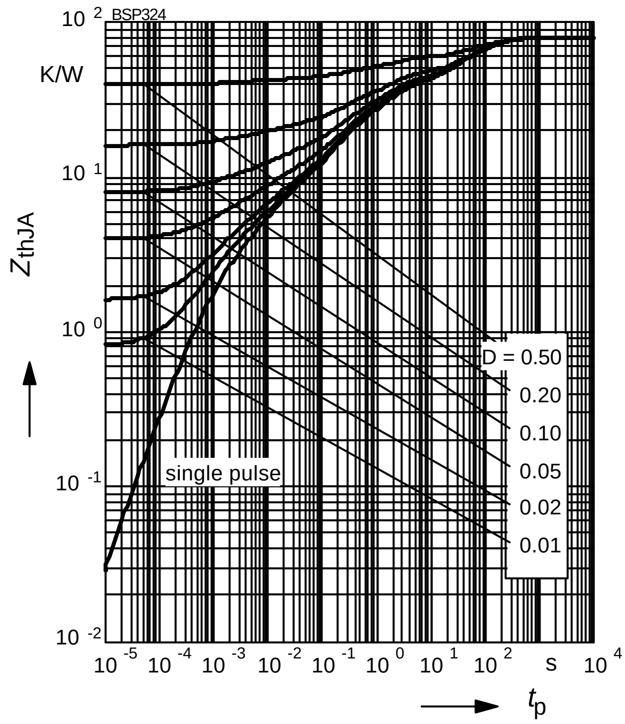
parameter : $D = 0$, $T_A = 25$ °C



4 Transient thermal impedance

$Z_{thJA} = f(t_p)$

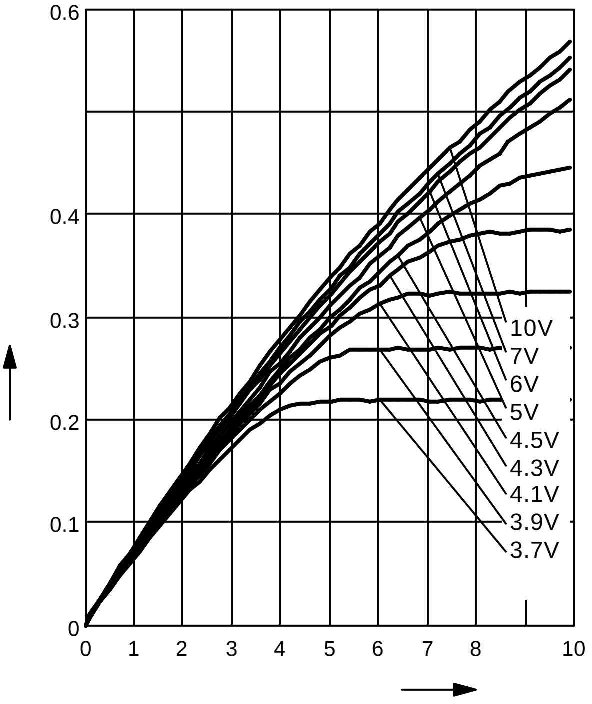
parameter : $D = t_p/T$



5 Typ. output characteristic

$I_D = f(V_{DS})$

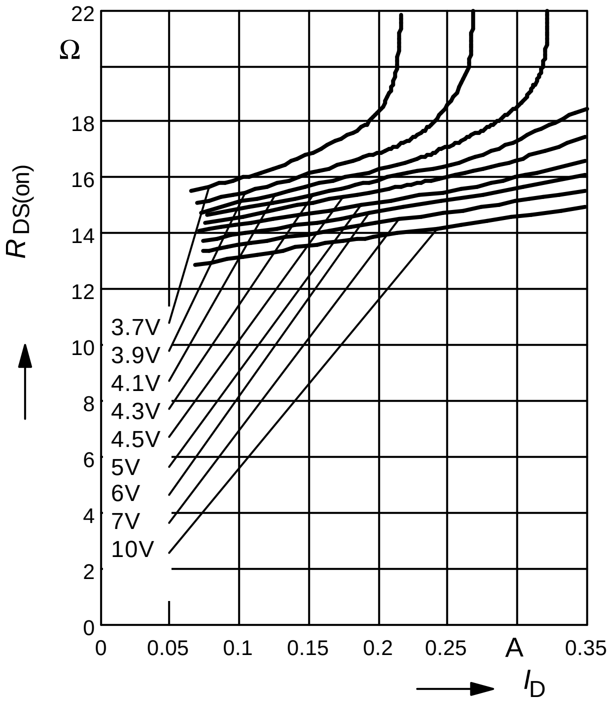
parameter: T_j = 25 °C, V_{GS}



6 Typ. drain-source on resistance

$R_{DS(on)} = f(I_D)$

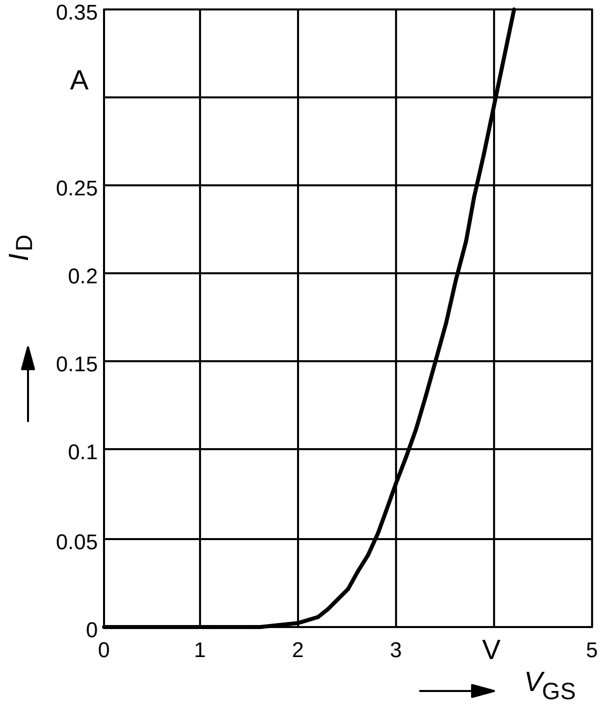
parameter: T_j = 25 °C, V_{GS}



7 Typ. transfer characteristics

$I_D = f(V_{GS})$; $V_{DS} \geq 2 \times I_D \times R_{DS(on)max}$

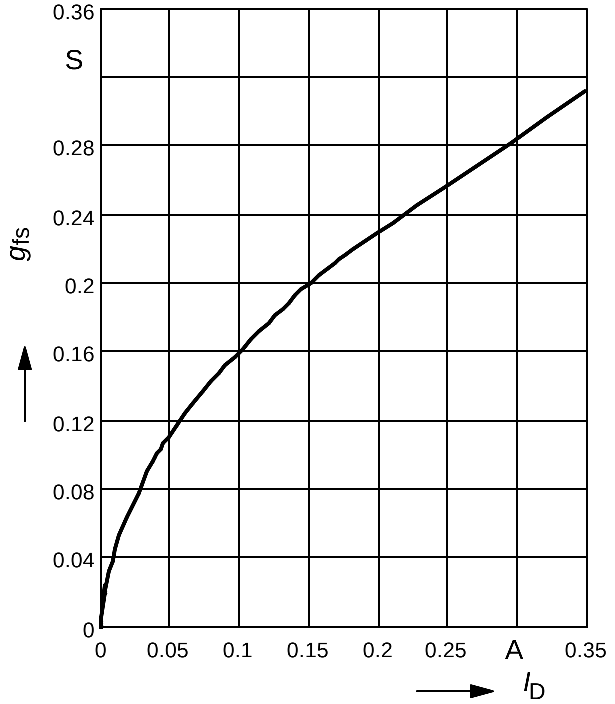
parameter: T_j = 25 °C



8 Typ. forward transconductance

$g_{fs} = f(I_D)$

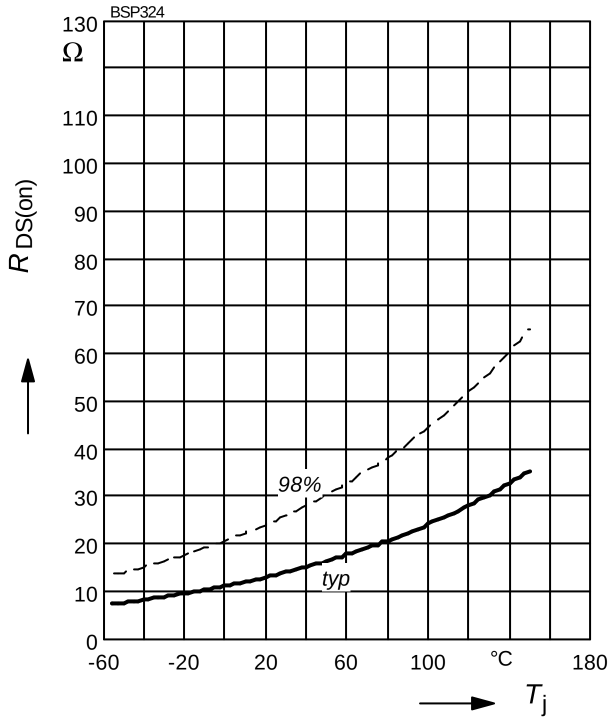
parameter: T_j = 25 °C



9 Drain-source on-state resistance

$R_{DS(on)} = f(T_j)$

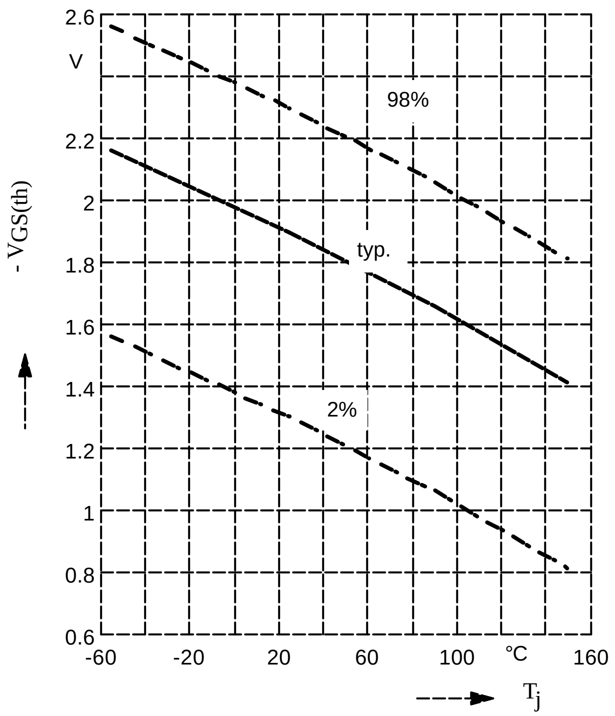
parameter : I_D = 0.17 A, V_{GS} = 10 V



10 Typ. gate threshold voltage

$V_{GS(th)} = f(T_j)$

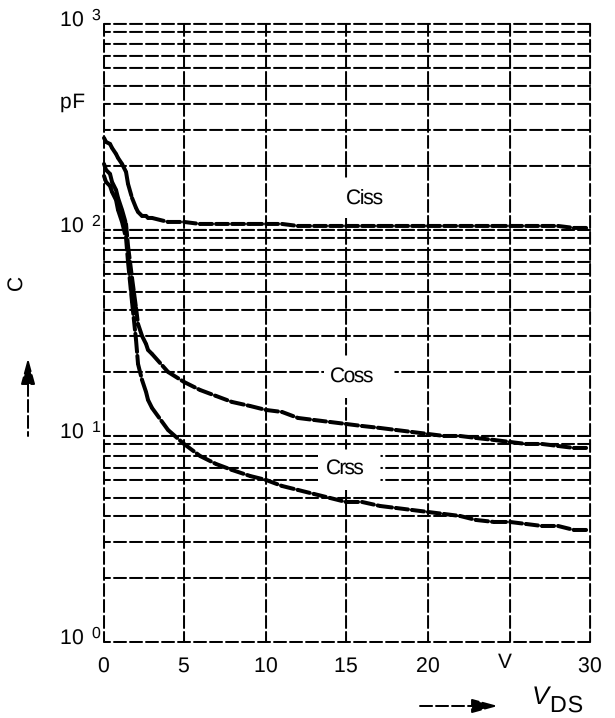
parameter: $V_{GS} = V_{DS}$; I_D =94µA



11 Typ. capacitances

$C = f(V_{DS})$

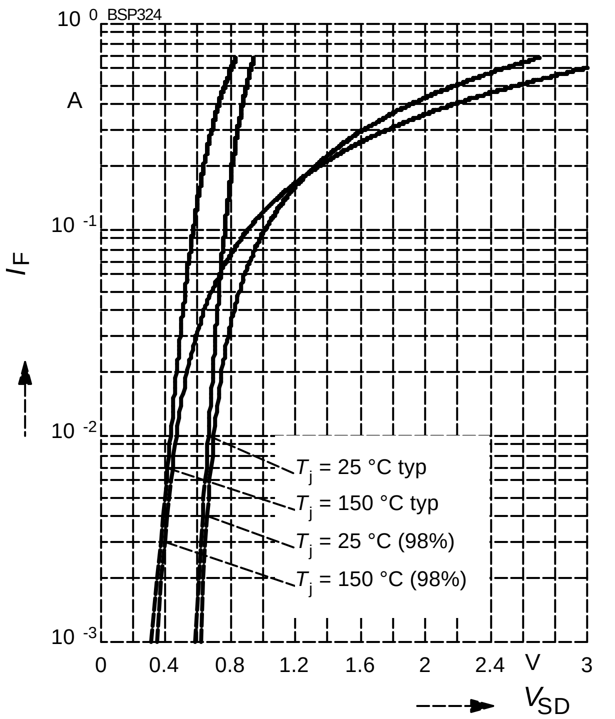
parameter: V_{GS}=0, f=1 MHz, T_j = 25 °C



12 Forward character. of reverse diode

$I_F = f(V_{SD})$

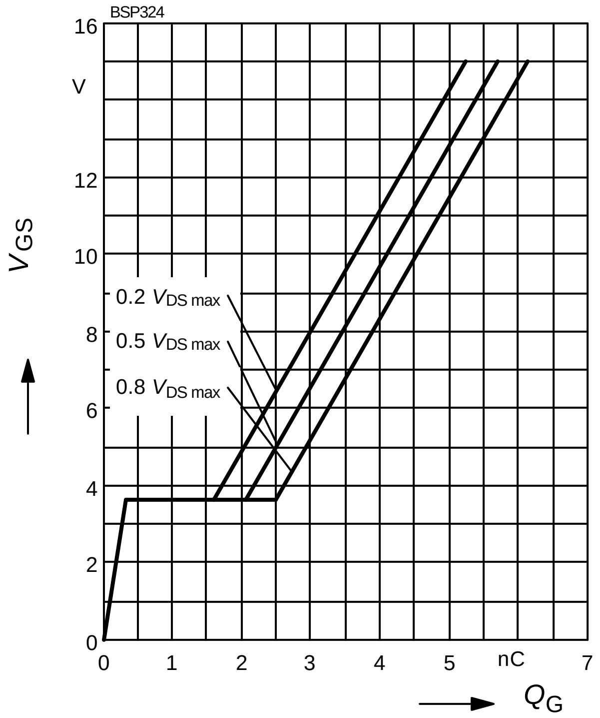
parameter: T_j



13 Typ. gate charge

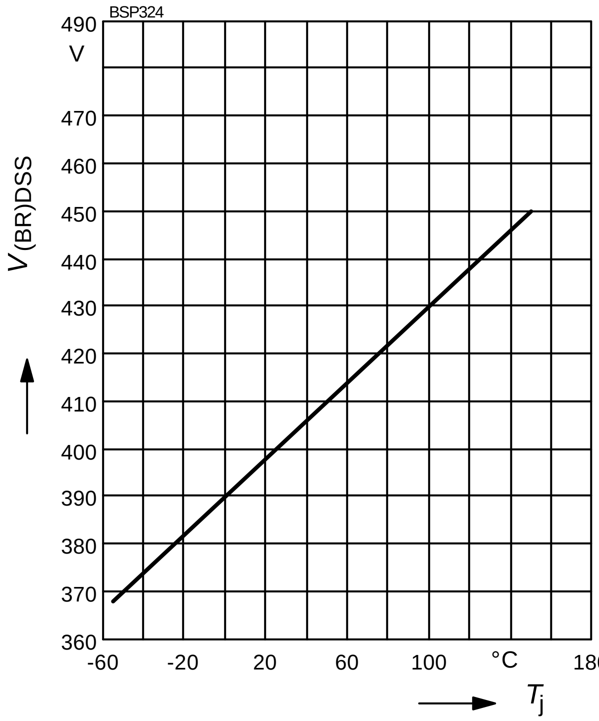
$V_{GS} = f\ (Q_G)$; parameter: V_{DS} ,

$I_D = 0.17$ A pulsed, $T_j = 25$ °C



14 Drain-source breakdown voltage

$V_{(BR)DSS} = f\ (T_j)$



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